

# Capstone IPT Representative High Priority Technology Areas



March 2007



Homeland  
Security

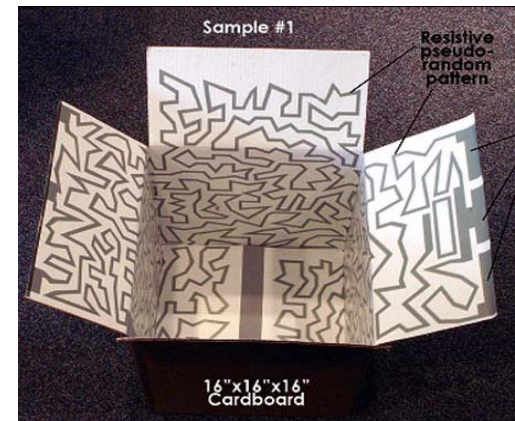
# Border Security: Representative Technology Needs

- Improved ballistic protection via personal protective equipment  
*(Borders/Maritime Division Lead)*
- Improve detection, tracking, and identification of all threats along the terrestrial and maritime border  
*(Borders/Maritime Division Lead)*
- Ability to access ICE databases in which voice information is entered; provide analytical, reporting, and automated case deconfliction; classify, identify voice samples *(C2I Division)*
- Non-lethal compliance measures for vehicles, vessels, or aircraft allowing for safe interdiction by law enforcement personnel *(Borders/Maritime Division Lead)*
- Non-destructive tools that allow for the inspection of hidden or closed compartments to find contraband or security threats *(Borders/Maritime Division Lead)*
- Improved analysis and decision-making tools that will ensure the development/implementation of border security initiatives *(Borders/Maritime Division Lead)*
- Ability to non-intrusively determine the intent of subjects during questioning  
*(Human Factors Division)*
- Ability for law enforcement personnel to quickly identify the origin of gunfire and classify the type of weapon fired *(Borders/Maritime Division Lead)*
- Ability for law enforcement officers to assure compliance of lawful orders using non-lethal means  
*(Borders/Maritime Division Lead)*



# Cargo Security: Representative Technology Needs

- Enhanced screening and examination by non-intrusive inspection  
(*Borders/Maritime Division*)
- Increased information fusion, anomaly detection, Automatic Target Recognition capability (*Borders/Maritime Division*)
- Detect and identify WMD materials and contraband (*Borders/Maritime Division*)
- Capability to screen 100% of air cargo  
(*Borders/Maritime Division*)
- Test the feasibility of seal security; Detection of intrusion  
(*Borders/Maritime Division*)
- Track domestic high-threat cargo (*Borders/Maritime Division*)
- Harden air cargo conveyances and containers (*Borders/Maritime Division*)
- Positive ID of cargo & detection of intrusion or unauthorized access  
(*Borders/Maritime Division*)



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# Chem/Bio Defense: Representative Technology Needs

- Tools to detect and mitigate animal disease breakouts (*Chem-Bio Division*)
- Policy net assessments to provide fresh perspectives on fundamental elements of the national biodefense strategy (*Chem-Bio Division*)
- Improved tools for integrated CBRN Risk Assessment (*Chem-Bio Division*)
- Incident characterization capability for response & restoration (*Chem-Bio Division*)
- Improved ChemBio Forensic Analysis capability (*Chem-Bio Division*)
- National-scale detection architectures and strategies to address outdoor, indoor (e.g., highly trafficked transportation hubs) and critical infrastructure (*Chem-Bio Division*)
- Consequence assessments of attacks on chemical facilities and Chem Bio attacks on other critical infrastructure (*Chem-Bio Division*)
- Integrated CBRNE Sensor Reporting capability (*Chem-Bio Division*)
- Handheld rapid biological and chemical detection systems (*Chem-Bio Division*)
- Detection paradigms and systems for enhanced, emerging and novel biological threats (*Chem-Bio Division*)



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# Cyber Security: Representative Technology Needs



- Secure internet protocols including standard security methods (*C2I Division*)
- Improved capability to model the effects of cyber attacks and understanding of internet topography (*C2I Division*)
- Comprehensive next-generation network models (*C2I Division*)
- Composable and scalable secure systems (*C2I Division*)
- Technologies and standards for managing identities, rights and authorities used in an organization's networks (*C2I Division*)
- Information system insider threat detection models and mitigation technologies (*C2I Division*)
- Analytical techniques for security across the IT system engineering life-cycle (*C2I Division*)
- Process Control Systems (PCS) security (*C2I Division*)

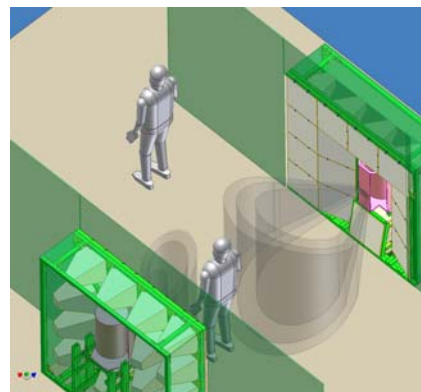


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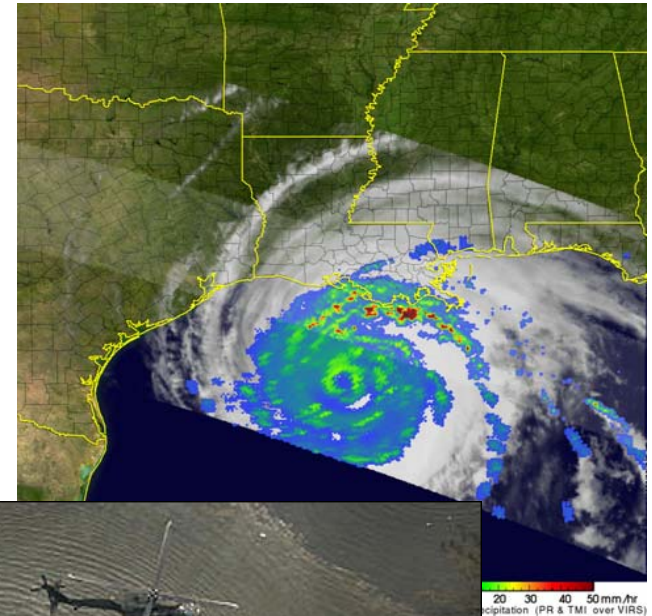
# Explosives Prevention: Representative Technology Needs

- Standoff detection on persons (portable solutions) (*Explosives Division*)
- System solution for detection in baggage (checked & carried) (*Explosives Division*)
- Capability to detect VBIED / large threat mass (container, trailer, ship, vessel, car, rail) (*Explosives Division*)
- Capability to detect homemade or novel explosives (*Explosives Division*)
- Capability to assess, render safe, and neutralize explosive threats (*Explosives Division*)
- Optimize canine explosive detection capability (*Explosives Division*)



# Incident Management: Representative Technology Needs

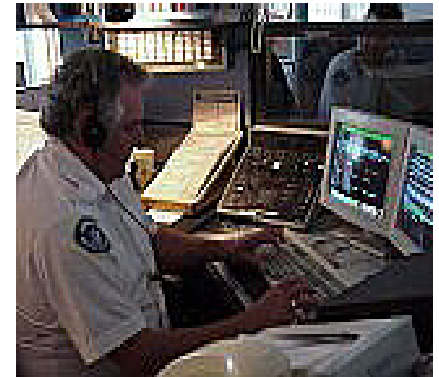
- Integrated Modeling, Mapping and Simulation capability (*IP/Geophysical Division*)
- Personnel Monitoring (Emergency Responder Locator System) capability (*IP/Geophysical Division*)
- Personnel Monitoring (Physiological Monitoring of Firefighters) capability (*IP/Geophysical Division*)
- Incident Management Enterprise System (*IP/Geophysical Division*)
- Logistics management tool (*IP/Geophysical Division*)



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# Information Sharing: Representative Technology Needs

- Data fusion from multiple sensors into Common Operating Picture (COP) *(C2I Division)*
- Improved real-time data sharing of law enforcement information *(C2I Division)*
- Management of user identities, rights and authorities *(C2I Division)*
- Distribution of Intelligence Products *(C2I Division)*
- Information sharing within/across sectors on terrorist threats *(C2I Division)*
- Automated, dynamic, real-time data processing and visualization capability *(C2I Division)*
- Analytic capabilities for structured, unstructured, and streaming data *(C2I Division)*
- Situational awareness between US Coast Guard and partners *(C2I Division)*
- Sensor fusion between Law Enforcement and Intelligence Partners *(C2I Division)*





# Infrastructure Protection: Representative Technology Needs



- Analytical tools to quantify interdependencies and cascading consequences as disruptions occur across critical infrastructure sectors (*IP/Geophysical Division*)
- Effective and affordable blast analysis and protection for critical infrastructure; improved understanding of blast failure mechanisms and protection measures for the most vital CI/KR (*IP/Geophysical Division*)
- Advanced, automated and affordable monitoring and surveillance technologies (*C2I Division*)



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# Interoperability: Representative Technology Needs



- Development and evaluation of Internet Protocol (IP) enabled backbones (*C2I Division*)
- Test and evaluation of emergent wireless broadband data systems (*C2I Division*)
- Acceleration of development and testing of P25 IP-based interfaces (*C2I Division*)
- Identification and development of message interface standards (*C2I Division*)
- Transition of Land Mobile Radios communication architectures to cellular based architectures (*C2I Division*)
- Evaluation of access technologies (*C2I Division*)
- Development of the complementary test procedures (*C2I Division*)



# Maritime Security: Representative Technology Needs

- Wide-area surveillance from the coast to beyond the horizon; port and inland waterways region - detect, ID, and track  
(*Borders/Maritime Division Lead*)
- Data fusion and automated tools for command center operations (*Borders/Maritime Division Lead*)
- Vessel compliance through non-lethal compliance methods (*Borders/Maritime Division Lead*)
- Enhanced capability to continuously track contraband on ships or containers  
(*Borders/Maritime Division*)
- Improved ballistic personal protective equipment for officer safety  
(*Borders/Maritime Division Lead*)
- Improved WMD detection equipment for officer safety; improved screening capability for WMD for maritime security checkpoints (*Borders/Maritime Division Lead*)





# People Screening: Representative Technology Needs

- Systematic collection and analysis of information related to understanding terrorist group intent to engage in violence  
(*Human Factors Division*)
- Non-invasive monitoring: Identifying and tracking unknown or potential threats from individuals at key checkpoints. Real-time detection of deception or hostile intent through integrated system of human and machine methods (*Human Factors Division*)
- Capability in real-time for positive verification of individual's identity utilizing multiple biometrics (*Human Factors Division*)
- Capability for secure, non-contact electronic credentials; contactless readers or remote interrogation technologies for electronic credentials (*Human Factors Division*)
- Mobile biometrics screening capabilities, to include hand-held, wireless, and secure devices (*Human Factors Division*)
- High-speed, high-fidelity ten-print capture capability  
(*Human Factors Division*)





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